COSMOS IN THE EAST.

In 1791 Antonio Jose Cavanilles established the genus *Cosmos* by a description and figure from life of *C. bipinnatus* (Icones et descript. plant., 1, p. 9, pl. 14) which had been brought into cultivation in the Royal Garden, Madrid, in 1789, by means of seed received from Mexico. On a later page of the same work he added to the genus *C. sulphureus* (p. 56, pl. 79), which was also in cultivation in the Royal Garden from Mexican seed; but in describing it, he failed to give the date of its introduction. It is very curious that within a few years his contemporary N. J. Jacquin described both these plants anew as species of *Coreopsis* and figured them from plants cultivated in Vienna, yet neither in exactly the same form as Cavanilles had. *C. sulphureus* was Jacquin's *Coreopsis artemisiaefolia* (Icones plant. rar 3, p. 16 pl. 595, date of the plate uncertain but towards if not in 1793), and *C. bipinnatus* Jacquin's *Coreopsis parviflora* (Plant. rar. Horti Schoenbrunnensis, 3, p. 65 pl. 374, 1798). Jacquin in his *Collectanea* (Suppl. 1796, p. 155) added that the first came from Mexico: the origin of the second he gave as unknown. His coloured figure of the first shows its ray florets to be orange in colour instead of sulphur; his description calling them fulvous. His description and figure of the second shows a small-headed state of *C. bipinnatus* which is well-known now as a wild plant. Persoon in 1807 renamed it *Cosmos parviflorus.*

In 1820 six new species were ascribed to the genus by Humboldt, Bonpland with Kunth (Nova species et genera, 4, pp. 239–242) from herbarium material, one being *C. caudatus.* The others have not been brought to the East and do not interest us. Unlike *C. bipinnatus* and *C. sulphureus*, *C. caudatus* has never come into cultivation in Europe; whereas those from the time when Cavanilles first examined them, have never gone out of cultivation, as is easily realised on an examination of the numerous catalogues of Botanic Gardens which the first half of the last century produced. Selection work was commenced; and in A. P. de Candolle's *Catalogus Horti Botanici Monspelensis,* 1813, p. 21, of *C. bipinnatus* there were already two varieties, one purple and the other pale-flowered. The small-headed *C. bipinnatus* var *parviflorus* after a time disappeared from catalogues.

Both *C. bipinnatus* and *C. sulphureus* found their way to India, the second it seems much more in the sulphur yellow race than in the orange race (see for instance Voigt's *Hortus Suburbanus Calcuttensis*, 1845, p. 416) and it has run wild existing now in places very remote from European stations. But as evidence for the orange-flowered plant having been in India in the first half of the last century, there is a specimen preserved by Wight, without further information than "flores rubri." It was probably taken from a garden.

C. caudatus has been mentioned as a species which has never been taken to European gardens; but as Merrill shows, it reached the Philippine islands direct from America by Spanish agency (Flora of Manila, 1912, p. 478). It is now found up and down the East. It is, for instance, widely distributed in the Philippines, and common as a weed about Manila where it flowers all the year round. Specimens of it have been seen from Amboina, north Borneo, and western Sumatra. Koorders (Excursionsflora Java, 3, 1912, p. 339) states that it sometimes runs wild in Java. It is cultivated by the Malays, and the Siamese, persisting about abandoned gardens, is in Burma, in northern India, in Mauritius and in the Seychelles. Apparently it has reached these places by transport westwards.

Merrill expresses an opinion (Enum. Philipp. plants 3, 1923, p. 614), that *C. sulphureus* also has been brought into the Philippines direct from America, but at a later date than *C. caudatus;* and he gives for it only one local name—the Spanish name "amarillo" meaning marygold, where he has several vernacular names for the old established *C. caudatus*, two at least referring to its rough snouted adhering fruits. It if very probable that he is right; but all the *C. sulphureus* in India apparently arrived *via* Europe, unless Wight's plant had another history.

In 1895 a very brilliant orange-flowered race was introduced from Mexico into the United States, and subsequently put upon the market under the name "Klondyke." This new introduction which is described in *Garden and Forest,* 8, 1895 p. 484 has brought into many lands a striking flower. It is spreading rapidly and has already run wild in the neighbourhood of some of the southern Chinese towns. When Wilhelm Miller stated (in Bailey's Standard Cyclopaedia of Horticulture. 2, 1914, article Cosmos, p. 862) that *C. sulphureus* was an introduction of 1896, he was referring to this race and had overlooked the century-and-a-quarter old introduction into Spain.

In 1918 Safford connected *C. sulphureus* with the xochipalli or paint-plant of the Aztecs of Mexico (Journ. Wash. Acad. Sci. 8, p. 613). Hernandez, the physician sent by Philip II of Spain to Mexico to collect information on economic plants, had described it in 1570 as then well-known to everybody: its flower moderately hot, of an agreeable odour and taste, comforting the heart, curing maladies of the womb and ulcers, especially such as appear in the mouth, giving a yellow dye for wool, and a paint for images, which in a certain measure approached red; for making the paint the flowers were boiled in water with alkali and the juice expressed and strained. Hernandez figured the xochipalli plant and in the figure Safford recognised *C. sulphureus:* then he took the juice of flowers of *C. sulphureus*, and found that alkali does intensify the colour. It is now desirable that some one should ascertain if the sulphur-coloured *C. sulphureus* is a race deficient in alkali or deficient in dye. Either is possible: and interesting experiments in genetics suggest themselves.

No writer has as yet recorded that *C. sulphureus* is used for dyeing in the East; and if, as Merrill suggests, the Spaniards at a relatively late date introduced it into the Philippines, probably, just as the British did in India, they took it as an ornamental plant, its tinctorial uses being entirely forgotten. It was otherwise with *C. caudatus*. That species the Spaniards carried across the Pacific because it served on board ship as a vegetable. They carried it, just as they carried *Amaranthus spinosus* and *Opuntia monacantha*. The last named is no longer eaten; but the Amaranth is; and under the name "ulam rajah" the Malays eat the *Cosmos*.

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CEDRELA IN THE MALAY PENINSULA.

Upon two occasions, and two only, mature Cedrela has been collected in the Malay Peninsula. Both were in 1886. In January of that year Sir George King's collector, Herman Kunstler, found a fruiting tree (his 10403) in a locality recorded as Ulu Bubong,—an unidentified valley apparently not far from the village of Kerling in north-eastern Selangor: and in May Charles Curtis obtained specimens of a flowering tree (his 826) upon Government Hill, Penang.

Kunstler's label states that his tree was 100 ft. high with a trunk 2–3 feet in diameter and with spreading branches. It stood in dense mixed forest at 400—600 feet above sea-level. Curtis' label gives the locality of his tree as close to the bungalow on Government hill at 2,500 feet, above sea-level; and the tree was 70—80 feet high, very large and spreading.

Gamble (Man. Ind. Timbers, 1922, p. 158) records that the average height of trees of a plantation of *Cedrela toona* in Assam 22 years old was 63 feet; and as Cedrelas grow fast it is not necessary to allow a greater age than 50 years to those which Kunstler and Curtis found.